REMARKS

Regarding paragraph 1 of the office action, the drawings are corrected by adding the reference to shaft 8 in paragraph 009 of the specification.

Regarding paragraph 2, "driven magnet" is changed to "driven magnet 3" in paragraph 0009 of the specification.

Grammatical and clarifying corrections are also being made to the claims that do not affect the scope of the claims.

The prior art rejections are respectfully traversed. Behnke et al. discloses a centrifugal pump, which is very different than a positive displacement pump as claimed because of the types of applications in which it is typically used. Magnetic couplings were first applied to centrifugal pumps since they comprise the majority of all pumps manufactured. Then, decades ago, magnetic couplings were applied to positive displacement (PD) pumps. Since centrifugal pumps are limited generally to non-viscous fluids, and applications of medium to low pressures, there was not much of a need to develop the application of orifices for modifying the circulation flow rate. The exception is for high vapor pressure liquids such as liquefied natural gas (LNG) and other light hydrocarbons where an orifice could be used on the circulation return side to build pressure in the containment can area - and thereby prevent vaporization, which in turn prevents heat removal by the liquid and could introduce cavitation to the impeller. This is in fact why an optional orifice can be used in Behnke et al, as stated in col. 5, lines 9-11. Nguyen et al. is in the same vein, being a centrifugal pump for liquids such as LNG.

Light hydrocarbons are in the clear minority of applications for PD pumps. Higher viscosity fluids typically don't require the containment offered by magnetic coupling. The present invention applies adjustable orifices to a positive displacement pump, which, for all the time that magnetic couplings have been used with positive displacement pumps, has not been done before. That Behnke teaches using an orifice only when pumping light hydrocarbons, teaches not to use an orifice when pumping liquids that are not light hydrocarbons, e.g., liquids that are liquid at room temperature and pressure, or are more viscous. These are the types of liquids that are typically pumped by PD pumps. Behnke et al. therefore would actually teach a person of ordinary skill in the art not to use an orifice when pumping the types of fluids that PD pumps are normally designed to pump.

The present invention is not disclosed or suggested by the prior art and would not have been obvious to a person of ordinary skill in the art. Gergets et al., which is for a PD pump, discloses typical cooling passageways, with no disclosure or suggestion of using an orifice in them. In fact, contrary to the invention, and particularly contra to claim 4, Gergets states that, "The vent passageways 136 on the discharge side of the rotary pump 121 must be smaller in diameter than the vent passages 140 of the suction side of the pump 121 for proper pumping action." (Col. 3, lines 32-36.) Also, this statement contravenes the teachings of Behnke et al. to the point that a person of ordinary skill would not be led to combine their teachings.

Jezek is for a valve cartridge for a high pressure PD water pump in which an orifice plug 68 is supplied to dampen pulsations, and different size orifices can be used for different degrees of dampening. There is no disclosure or suggestion to supply an adjustable orifice in the cooling passageway through the pump flange of a PD pump.

Accordingly, allowance of claims 1-6 as amended is respectfully requested.

No additional fees for filing this amendment are believed to be due. However, if such fees are due, the Commissioner is hereby authorized to charge them to deposit account no. 17-0055.

Respectfully submitted,
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